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ABSTRACT

This study was intended to determine whether differences in maternal attitude and behavior relate to differences in infants' Strange Situation security classification. Subjects for the present study were 38 white middle-class mothers and their normal, 1-year-old infants (20 male, 18 female). Infants who were classified as to the quality of their attachment relation to their mothers at 12 months in the Strange Situation were seen nine months later in a free play session with their mothers. Results showed that infants judged more secure at 12 months had mothers who (when their infants were 21 months) were judged significantly more sensitive, more accepting, and were more expressive of positive affect than mothers of insecurely attached infants. Also, mothers of insecurely attached infants showed significantly more anger than mothers of securely attached infants. It was found that differences in infants' apparent security at 12 months can be meaningfully related to differences in mothers' social and affective behavior nine months later. (Author/MS)

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Mothers of "Secure" Vs. "Insecure" Babies Differ Themselves Nine Months Later

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The authors gratefully acknowledge the enduring guidance of Dr. Mary Main (University of California, Berkeley) without whose generous persistence this paper would not have been possible.

For some time now Ainsworth and her colleagues have argued that the "Strange Situation" test, a 20-minute, structured laboratory observation, provides effective measures of individual differences in the quality of the infant-mother relationship. They have placed special emphasis on observed relationships between infants' apparent security in relation to their mothers as assessed in the strange situation at 12-months and maternal caregiving styles and behaviors throughout the preceding year. For example, they have found that differences in mothers' rated sensitivity and acceptance of their babies are systematically related to their infants' strange situation behavior (Ainsworth, et al, 1971); likewise to aspects of infant behavior during the first year (Ainsworth, et al, note 1). These relations have all been based on detailed home observation throughout the first year of life on a small sample (n=23). Of these original Baltimore babies nine were classified as securely attached, ten insecurely attached and the smallest group, only of four, intermediate in security.

The present study was conducted to determine whether similar relationships between maternal attitude and behavior and infant security would be found in a new sample. We rated sensitivity and acceptance because Ainsworth and her colleagues (Ainsworth, et al, 1971) had found particularly strong differences among mothers in terms of sensitivity and acceptance, with mothers of infants judged moderately secure falling in the middle of her rating scales. Since we also believed the mother's anger and her attitude towards contact, specifically aversion to contact, strongly affect security (Main, in press) these aspects of maternal behavior were also rated. Finally, on the basis of a growing literature on affective communication, especially by facial expression, we decided also to rate expressiveness. In contrast to the Ainsworth study, the measures of maternal behavior were taken following rather than preceding the strange situation and in a different setting.

Method

Subjects

The subjects were 38 white middle-class mothers and their normal, one year old infants (20 male and 18 female). The mothers were college educated, and were contacted through the cooperation of pediatricians. Eighty-five percent of mothers contacted agreed to participate in the study.

Procedures and Records

Mothers and babies were first seen in the Ainsworth strange situation test at 12 infant months. They were seen again at 21 months in a play session.

The strange situation test was conducted in the laboratory. This familiar procedure consists of eight brief episodes, each (except the first) three minutes long (see Ainsworth & Wittig, 1969). The situation involves (from the viewpoint of the infant, who is constantly present within the room) an unfamiliar room containing toys, a stranger, and two brief separations from and reunions with the mother who leaves the baby once with the stranger, and once alone in the room. Separation episodes are terminated if the infant is more than mildly distressed. The crucial episodes for assessing the quality of the mother-infant relationship are the two episodes of mother-infant reunion.

Two observers, behind one-way vision glass, dictated a running account of the behavior of the participants in the strange situation. The transcribed narrative records served as the basis for the classifications of infant behaviors.

At 21-months the toddlers and their mothers were videotaped in a naturalistic play session in a bright and comfortable lab room containing toys. Written instruction requested that the mother behave as she would if "mildly pre-occupied" at home. She was to respond to the child as necessary, but otherwise not to direct his activities. The mother was also given a short form to fill out

concerning aspects of the child's previous experience.

Mother and child were alone in the room for ten minutes of free play. Then an adult female who had spent several minutes becoming acquainted with the child just prior to the play session entered the room. She first greeted mother and child, then settled a box of toys she had brough with her, and then invited the child to a game of ball. After 20 minutes of playing a series of structured games with the playmate, the child was left alone with the mother for another 20 minutes of free play. Then music signalled the mother to begin to play with the child in any manner she found comfortable. This final episode of mother-child play lasted ten minutes.

Ratings of maternal behavior were made by repeated viewing of the tape (sensitivity and acceptance), or from narrative records based on repeated viewings (anger, aversion to contact, and expressiveness), or from slides. Two slides were taken from each tape: The first slide was taken at the first sight of the mother during the playmate's entrance (when the mother's attention was directed to the playmate, usually). The second slide was taken at the first opportunity once the game of ball between the playmate and the toddler began, when the mother's attention was likely to be directed to the toddler. For judging purposes, the slides were masked to obscure sight of the toddler.

Four different raters were used for the seven measures, each "blind" to the strange situation behavior of the infants and to others' ratings. One person rated sensitivity only; another rated acceptance only, but made the narrative records; another rated anger, aversion to contact, and expressiveness; another rated expressiveness from slides.

Measures

Infant strange situation behavior. Infants were classified on the basis of their behavior in the reunion episodes of the strange situation, and

following instructions provided by Ainsworth. They were judged either as securely attached (n=15), insecurely attached (n=14), or intermediate in security (n=9). Infants were judged securely attached when they greeted the mother and sought contact with her, while showing little or no avoidance or resistance. They were judged insecurely attached when they displayed either strong avoidance of the mother or resistance in physical contact with her. An intermediate group of infants substituted interaction for proximity seeking or coupled proximity seeking with avoidance.

Inter-judge agreement on the classification of the first 20 subjects was .95.

Maternal measures. Sensitivity vs. insensitivity to the child's signals and communications, and acceptance vs. rejection of the child, were each rated from the ten minute mother-child play session. The 9-point scales used were adapted from the scales which Ainsworth (Ainsworth, et al, 1971) had devised for mothers interacting with 9 to 12 month old infants. The scales are highly detailed, and alternate points are clearly defined.

Ratings for anger, aversion to contact, and expressiveness were based on viewings of 20 minutes of the video tapes - the first 10 minutes of free play, and the 10 minutes of mother-child play - and were scored on 7-point scales. Anger was revealed both directly and indirectly. Some mothers spoke angrily to their child, their posture and facial expression leaving no doubt regarding their mood. Some did so appropriately (when the child was disobedient) and some inappropriately (when, for example, the child accidentally tipped over a cup of "pretend" tea). Other mothers had a kind of pervasively angry attitude, showing disgust, staring the child down, or silently turning away. High scores were given to mothers who showed continual underlying anger, low scores to momentary irritation.

Aversion to physical contact was scored on the basis of several different aspects of the mother's non-verbal behavior. Instances of shrinking back from the toddler as he approached, and adopting odd or uncomfortable postures seemingly to avoid contact, were given heavy weighting; while simply being physically distant from the child was considered only very slight evidence.

The scales for expressiveness referred to emotional expressiveness of every kind, witnessed in single slides of the face, or throughout the 20 minutes. On the tape, mothers were regarded as extremely inexpressive when they not only habitually lacked emotional expression, but failed to show it when it would have been appropriate (when, for example, the child deliberately struck the mother or even threw something at her). Highly expressive mothers had quick, and sometimes extreme, emotional response to their situation; they were rated highly whether or not the emotion seemed genuine, and whether or not it was appropriate.

Inter-rater reliability was estimated for each of these scales: For all scales but acceptance ($r(.5) = .76$) the correlation coefficients were in the .80's.

Results

Intercorrelations Among the Maternal Variables

Intercorrelations among the seven ratings of maternal behavior are presented in Table 1 (Pearson r). Despite the fact that three different persons rated these maternal behaviors the mother's sensitivity, acceptance, and anger were fairly highly correlated and in the expected direction. Expressiveness rated over 20 minutes was negatively related to anger and to aversion to contact, while it was positively related to maternal sensitivity. The mother's expressiveness rated from a single slide during the game of ball - when the mother

was concerned with the toddler - was positively related (r = .40) to expressiveness rated over 20 minutes using all possible behavioral indices. Expressiveness in the mother's face on this single slide was also significantly negatively related to anger and was negatively related at the trend level to aversion to contact. The degree to which the mother's face expressed emotion during the playmate's entrance was unrelated to all other (toddler-related) aspects of behavior. It is worth noting that since the playmate's entrance necessarily preceded her playing ball with the toddler, the mother's face changed between free play and the game of ball. Thus the expression on the slide taken during the game of ball is not a simple carry-over from the expression in free play.

Analysis of Maternal Ratings in Terms of Strange Situation Classifications

Table 2 presents the results of the one-way analysis of variance used to compare mothers of the three groups of infants differing in quality of attachment. (The t-test is used to compare extreme groups.)

As can be seen in Table 2, for six out of the seven variables, the means for the mothers of toddlers judged "moderately secure" based on observations nine months earlier fall between the means for the extreme groups. Moreover, all differences between the mothers of the secure and the mothers of insecure toddlers are in the expected direction.

Mothers of secure toddlers were significantly more sensitive and more accepting than mothers of insecure toddlers. The mother of the secure toddler was given a mean rating of 6.7, definitely accepting, while the mother of the insecure toddler was given a mean rating of 4.1, more rejecting than accepting.

The most pronounced differences in the study concerned mothers' anger with the child: mothers of insecure toddlers were rated as substantially more

angry than mothers of secure toddlers, $t(35) = -3.70$, $p<.001$. Differences in aversion to contact were slight and insignificant.

Mothers of secure toddlers were found significantly more emotionally expressive when all aspects of behavior - face, voice, and body movement - were considered and rated over 20 minutes. Their faces also showed more expression as they watched their child during the game of ball. And, importantly, even though expressiveness during the playmate's entrance was unrelated to expressiveness during the game of ball, their faces were more expressive at the playmate's entrance.

Discussion

The findings for this sample, viewed at a different age and under quite different conditions from the original Ainsworth sample, is affirming of the Ainsworth claims. Mothers of 12-month olds, rated as secure, have been found significantly more sensitive, more accepting, more expressive of affect and less angry than mothers of insecure toddlers nine months later. These findings, along with those from Ainsworth's sample point to a validation of the strange situation test in that it not only can be shown to have antecedents but can meaningfully predict to consequences as well. These results also suggest that differences in mothers' attitudes and affective communication to their infants, both verbal and non-verbal, are somewhat stable.

In addition to the variables which are similar to Ainsworth's such as sensitivity and acceptance, we perhaps were able to tap more directly aspects of affective communication in our "expressiveness" variables. There has been increasing interest in and importance placed on non-verbal means of communication between mother and infant. Walters and Parke (1965) spoke of the importance of the distance receptors in mother-infant interaction; Robson (1967) directly

addressed the role of face-to-face behaviors in the ontogeny of attachment; Blehar, Lieberman and Ainsworth (in press) demonstrated a relationship between strange situation security of infants and mothers' behavior in face-to-face interaction with the baby in the first three months as gleaned from narrative records. Recently film analysis of face-to-face interaction has highlighted the importance of facial mobility and responsiveness in affecting the rhythmicity and quality of the interchanges between mother and infant. For example, Brazelton, et al (1975) report a disruptive or disturbing effect on young infants when their mothers followed instructions to approach their infants with frozen, unresponsive faces. There is also evidence from clinical pediatrics that (to quote from Brazelton, et al, 1975): "infant-mother pairs who have failed to thrive demonstrate a chaotic non-synchrony, with evidence of how painful facial communication, eye-to-eye contact and asynchrony of rhythms have become." Perhaps the quality of this early dyadic communication has an impact on the infant's growing view of himself and of his world as he enters into toddlerhood and beyond. It appears that this area of affective communication in the mother-infant dyad is a most fruitful one for future inquiry.

It has been shown before by Main (1976) that differences in the strange situation classification of infants at 12-months related meaningfully to differences in their exploration, cognitive level, and play with toys and with adults at 21-months of age. The picture we have here is one of differences in both mothers and babies at 21-months relating to infants' security classifications at 12-months. Apparently, the strange situation classifications refer not only to differences in individuals or differences in temperament, rather they refer to differences which are dyadic.

Reference Note

1. Ainsworth, M. D. S., Blehar, M. C., Waters, E., and Wall, S. The strange situation. Monograph in preparation.

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Table 1

Intercorrelations Among Maternal Ratings

	Sens.	Accept.	Anger	Averse Contact	Express.	Game Express.
Sensitivity						
Acceptance[a].....	.67***					
Anger	-.69***	-.77***				
Aversion to contact	-.44**	-.36*	.66***			
Expressiveness	.54***	.49**	-.63***	-.49**		
Expressiveness from slide during game[b]..	.28	.19	-.43**	-.32	.40*	
Expressiveness from slide at entrance[c]..	-.06	-.13	-.01	-.07	.06	.24

[a] $\underline{n} = 37$

[b] $\underline{n} = 35$

[c] $\underline{n} = 32$

* $p < .05$

** $p < .01$

*** $p < .001$

Table 2

Analysis of Maternal Ratings in Terms of Strange Situation Classifications Made at Twelve Months

Ratings Given Mothers Nine Months Following The Strange Situation	Means for Strange Situation Groups: Insec. (1)	Mod. Sec. (2)	Sec. (3)	Analysis of Variance	A Priori Contrast: Most Secure (3) vs Least Secure (1)
Sensitivity	4.6	5.6	6.2	$F(2,35) = 3.68^{*}$	$t(35) = 2.71^{**}$
Acceptance	4.1	5.6	6.7	$F(2,34) = 5.03^{**}$	$t(34) = 3.17^{***}$
Anger	3.6	1.9	1.5	$F(2,35) = 7.42^{***}$	$t(35) = 3.70^{***}$
Aversion to contact	3.3	2.9	2.5	$F(2,35) = .69$	$t(35) = -1.18$
Expressiveness	3.7	3.6	5.3	$F(2,35) = 2.72$	$t(21)^{a} = 2.17^{*}$
Expressiveness from slide during game.	2.6	2.8	3.9	$F(2,32) = 4.17^{*}$	$t(32) = 2.70^{**}$
Expressiveness from slide at entr.....	2.9	4.0	4.1	$F(2,29) = 2.34$	$t(24)^{a} = 2.33^{*}$

[a] separate variance estimates were used in these t computations.

* $p < .05$

** $p < .01$

*** $p < .005$